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Vol. 6, No. 7. WASHINGTON, D. C. February, 1937.

Agricultural Engineering.

Some comment on the Ag Engineers winter meeting. Farm Implement News. v. 57, no. 26. December 17, 1936. p. 20-23.

Agriculture.

Engineering aspects of farm operating efficiency. By George R. Boyd. Agricultural Engineering. v. 18, no. 1. January, 1937. p. 11-12, 14. Studies tend to show that fertility of soil is not most important factor in determining profitableness of any farm. So far results seem to show that it is labor and equipment, including buildings and machinery, which are put on the land, which determine its income value. These are engineering elements of farm business, and it would appear that importance of their effect upon the farm business has been underestimated in planning for better agriculture and more prosperous farms.

Graphic summary of farm tenure (based largely on the census of 1930 and 1935). H.A. Turner, Washington, D.C., 1936. 52p. U.S. Department of Agriculture. Miscellaneous publication no. 261.

Looking ahead in American agriculture. By O.E. Baker. American Fertilizer. v. 85, no. 13. December 26, 1936. p. 5-7, 26.

Air Conditioning.

Air conditioning manual. Domestic Engineering. v. 149, no. 1. January, 1937. p. 78-80. Prepared by National Domestic & Farm Pumping Equipment and Allied Products Manufacturers.

Conditioned air? By Philip H. Smith. Scientific American. v. 155, no.2. August, 1936. p. 80-83. What is air conditioning? Newer concepts. Present status. Design trends. Complex problems of heating. House insulation involved.

Comfort cooling in the research residence at the University of Illinois. By A.P. Kratz and H.J. Macintire. Refrigerating Engineering. v. 33, no. 1. January, 1937. p. 29-38. As result of tests during summer of 1932, using ice for cooling because of its ease in calculation of refrigeration board, program of investigation was worked out consisting of: a) Use of night air and ice cooling during summer of 1933, b) use of four-cylinder refrigerating unit, employing dichlorodifluoromethane, of about 2½ tons of refrigeration capacity, during summer of 1934, c) use of deep well water initially at 58° F., during summer of 1935, d) use of water precooled to temperature below 58° F.

Air Conditioning. (Cont'd)

Modern equipment for dehumidification by absorption. By W.E. Stark. Refrigerating Engineering. v. 33, no. 1. January, 1937. p. 19-23, 50-52. Although paper is directed particularly toward use of silica gel as dehumidifying agent in comfort and industrial air conditioning work, it is generally pertinent to use of all of several agents which are available for direct dehumidification.

Refrigeration in reverse used to heat Virginia home. Air Conditioning and Refrigeration News. v. 19, no. 18. December 30, 1936. p.13.

Summer air-conditioning using well water. By C.D. Leiter. Farm Implement News. v. 58, no. 2. January 28, 1937. p. 28-29.

Alcohol Fuel.

Alcohol blended gasoline. Brewers Technical Review. v. 11, no. 12. December, 1936. p. 407. Denying that alcohol-blended gasoline is losing favor in Germany, Dr. Friedrich Bergius, Nobel chemist and inventor of oil from coal, and sugar from wood processes, predicts that "a proper blend of ethyl (grain) alcohol, methyl (wood) alcohol, benzene and gasoline bears promise of supplying the world with the ideal motor fuel for internal combustion engines."

Critical study of alcohol-gasoline motor fuel. Brewers Technical Review. v. 12, no.1, part 1. January, 1937. p. 131. J.Z. Schneider of Polytechnical School in Prague, Czechoslovakia, recently published results of his comparative tests with gasoline and alcohol-gasoline mixtures of various compositions, which were undertaken to demonstrate real practical value of both fuels for the motorist.

Manufacture of alcohol from sugarcane by-products. By W.L. Owen. Sugar Bulletin. v. 15, no. 4. November 15, 1936. p. 4-7.

Power alcohol jag. By V.A. Leslie. Commercial Car Journal. v. 52, no. 3. November, 1936. p. 50-53. Table 1. Cost of fuel alcohol in eleven European countries (1935).

Power-alcohol plant. Brewers Technical Review. v. 12, no. 1, part 1. January, 1937. p. 14. Two batches of anhydrous ethyl alcohol made from corn, amounting to 2,000 gallons, have poured from stills of Chemical Foundation-sponsored plant of Bailor Manufacturing Company at Atchison, Kansas. Alcohol-blended gasoline under the name of agrol will be on sale shortly in seven mid-western states at prices that will compete on quality basis with straight gasoline fuels. Atchison plant produces butyl as well as ethyl alcohol and as valuable by-product evaporates spent mash into a protein feed for stock. Butyl alcohol is used in connection with ethyl alcohol production. Ethyl alcohol is blended with gasoline to produce motor fuel. Whole output of Bailor plant is being taken by Chemical Foundation of Kansas for distribution at price not to exceed 25 cents a gallon.

Barns.

Masonry barn design and construction. Henry Giese, H.J. Barre and J. Brownlee Davidson. Ames, Iowa. 1936. 255-297p. Iowa. Agricultural experiment station. Research bulletin no. 207.

Building Construction.

Cost techniques: an evaluation of construction cost data, including basis and application of all major methods of estimating building cost. Architectural Forum. v. 65, no. 2. August, 1936. p. 107-110.

Standard definitions clarify science of acoustics. By H.A. Frederick. Industrial Standardization and Commercial Standards Monthly. v. 8, no. 1. January, 1937. p. 1-7.

Corrosion.

Aluminum and its alloys in design of corrosion-resistant machinery and equipment. By E.H. Dix, Jr., and R.B. Mears. Mechanical Engineering. v. 58, no. 12. December, 1936. p. 784-792,

Atmospheric corrosion tests on wire and wire products are under way. American Society for Testing Materials Bulletin. no. 83. December 14, 1936. p. 3-6. Research program has two major objectives: (1) to obtain essential engineering information concerning materials involved and (2) to assist in establishing national standard specifications for fencing, barbed wire and other products which will afford consumers an adequate guide in purchasing materials.

Cast iron in chemical equipment. By H.L. Maxwell. Mechanical Engineering. v. 58, no. 12. December, 1936. p.803-808, 845. Paper reviews ways in which older types of cast iron have been used in chemical-process equipment and how, following failure in service, some of compositions have been improved to provide materials of construction for equipment in which chemical products meeting all requirements as to quality have been produced at relatively low cost.

Copper and copper-base alloys in the construction of corrosion-resisting equipment and structures. By R.A. Wilkins. Mechanical Engineering. v. 58, no. 12. December, 1936. p. 809-822.

Corrosion-resistant lead equipment. By George O. Hiers. Mechanical Engineering. v. 58, no. 12. December, 1936. p. 793-798.

Corrosion-resistant metals. By F.N. Speller. Mechanical Engineering. v. 58, no. 12. December, 1936. p. 781-783. Introductory paper to a symposium on their use in the design of machinery and equipment.

Corrosion-resistant stainless steels and irons. By J.H. Critchett. Mechanical Engineering. v. 58, no. 12. December, 1936. p. 823-826. Attempt is made in present paper to lay a foundation for selection of proper quality of stainless steel, based on combination of laboratory tests and practical results achieved in application.

Corrosion. (Cont'd)

Nickel and nickel-base alloys: Their use in the design of corrosion-resistant machinery and equipment. By F.L. LaQue. Mechanical Engineering. v. 58, no. 12. December 1936. p. 827-843.

Zinc in the chemical industries. By E.A. Anderson. Mechanical Engineering. v. 58, no. 12. December, 1936. p. 799-802.

Cotton and Cotton Ginning.

Air-blast gin gauge and fan control. By C.A. Bennett. Cotton Ginners' Journal. v. 8, no. 4. January, 1937. p. 5-6, 14.

Ginnings of cotton. Farmer-Stockman. v. 49, no. 19. October 1, 1936. p. 9. Number of bales of cotton ginned from growth of 1936 prior to September 1, 1936, and comparative statistics to corresponding dates in 1934 and 1935 are shown in table.

Rust Brothers invent improved cotton picker. Science News Letter. v.30, no. 814. November 14, 1936. p. 313.

Some economic problems of cotton gins in Oklahoma. Roy A. Ballinger and R.C. Soxman. Stillwater, Okla., 1936. 76p. Oklahoma Agricultural experiment station. Bulletin no. 231.

Variability of fiber length in a relatively uniform strain of cotton. By T.R. Richmond and H.J. Fulton. Journal of Agricultural Research. v. 53, no. 10. p. 749-763. November 15, 1936. Paper describes methods used in determining variability of length and gives results of fiber-length studies of strain of Pima cotton grown at Sacaton, Arizona in 1934.

Dams.

Experiments aid in design at Grand Coulee. By Jacob E. Warnock. Civil Engineering. v. 6, no. 11. November, 1936. p. 737-741.

Scour prevention below Bonneville dam. By J.C. Stevens. Engineering News-Record. v. 118, no. 2. January 14, 1937. p. 61-65. Model studies result in modification of the original design for the spillway of the dam. Final design altered from theoretically correct design because expected changes in tailwater level.

Selection of materials for rolled-fill earth dams: Discussion. By T.T. Knappen and Paul Baumann. Proceedings of the American Society of Civil Engineers. v. 62, no. 10. December, 1936. p. 1618-1624.

Selection of materials for rolled-fill earth dams: Discussion. By William C. Hill, A. Floris and Fred D. Pyle. Proceedings of the American Society of Civil Engineers. v. 63, no. 1. January, 1937. p. 198-201.

Diesels.

Diesel data. Industrial Power. v. 32, no. 1. January, 1937. p. 70, 72. Gives data on fuel consumption by modern Diesel engines of numerous sizes.

Dryers.

Modern hop oasts and their equipment. By Frank H. Slade. Rural Electrification and Electro-Farming. v. 12, no. 139. December, 1936. p. 139-141.

Electricity-Distribution.

Customers now exceed 26,000,000. Electrical World. v. 107, no. 1. January 2, 1937. p. 70-74. Domestic customers increased more than half million. Net gain of farm services close to 80,000.

High lines down the byways. By Arthur W. Baum. Country Gentleman. v. 106, no. 12. December, 1936. p. 5-6, 74, 76.

Nebraska Power Companies plan to extend rural electrification. Electrical World. (news issue) v. 106, no. 52. December 26, 1936. p. 7. Privately owned units completing one of largest line extension programs in history of state. About 4,000 miles now serving 5,000 customers. Estimate $27,000,000 cost to serve 46,000 farm homes.

Niagara Hudson power to expand rural lines at $2,225,000 cost. Electrical World. News issue. v. 106, no. 52. December 26, 1936. p. 3-4. Ambitious construction program will provide service to over 86% of all farm customers in area served.

Rural electrification. By M.J. Briggs. Hoosier Farmer. v. 21, no. 11. November, 1936. p. 10, 27. Recent allocation of supplemental funds for five more rural electric projects, and artial allotments for two others gives Indiana its maximum allowance of $4,215,000 under 1936-37 federal program of rural electrification. In addition to having first state to receive its maximum allotment of funds for first year's construction program.

Rural electrification progresses. Farm and Ranch. v. 55, no. 23. December 1, 1936. p. 16. Facts concerning progress being made in Texas and Oklahoma.

Rural load builders convene at farm power sales conference. Electrical World. News issue. v. 106, no. 52. December 26, 1936. p. 5. General electric is host to 200 utility representatives for discussion of complete rural load building policy.

Rural mileage expected to exceed 36,000 in 1937. Electrical World. v. 107, no. 1. January 2, 1937. p. 90-91. Expenditures seen reaching $48,000,000. Record-breaking pace to continue.

Electricity Distribution. (Cont'd)

Rural power projects planned for Colorado. Electrical World. News issue. v. 106, no. 52. December 26, 1936. p. 7. Approximately 1,000 rural residents of San Luis valley, Colorado, who do not now have domestic electric service, have signed up for three separate federal rural electrification projects. Three San Luis projects together would serve district comprising 600 square miles and would cost approximately $225,000.

Texas utility extends rural electric lines. Electrical World. News issue. v. 106, no. 52. December 26, 1936. p. 5-6. Company will have completed more than 2,000 miles of lines in 1936 when year closes, lines which will make service available to more than 10,000 farms and rural homes.

Electricity on the Farm.

Electric incubation -- II. By A.H. Rankin and W. LePage. Rural Electrification and Electro-Farming. v. 12, no. 139. December, 1936. p. 142-144.

Electrified agriculture. By Morris L. Cooke. Work. v. 1, no. 4. December, 1936. p. 14-16.

Rural electrification aids Italian back-to-the-farm movement. By Erwin Straus. Rural Electrification News. v. 2, no. 5. January, 1937. p. 8-9. Has achieved leading position in Europe in use of electricity for irrigation and land reclamation.

Rural electrification brings electrical equipment to the farm. By J.M. Fore. Purdue Agriculturist. v. 31, no. 4. January, 1937. p. 44.

Erosion Control.

Corduroy coat protects high plains from drought. By Fred C. Newport. Soil Conservation. v. 2, no. 7. January, 1937. p. 139-140, 145.

Driving in the rain. By C.W. Mullen. Farmer-Stockman. v. 49, no. 19. October 1, 1936. p. 3.

Erosion control in Ohio farming. D.R. Dodd. Columbus, O., 1937. 40p. Ohio. University. Agricultural extension service. Bulletin 186.

Following contour furrows across the United States. By A.T. Semple. Soil Conservation. v. 2, no. 7. January, 1937. p. 134-139, 145.

Grass for greedy gullies. By Ivy M. Howard. Farm and Ranch. v. 55. no. 23. December 1, 1936. p. 2.

New method of studying erosion aids selection of valve seat materials. By Fred R. Venton. Heating, Piping and Air Conditioning.

v. 9, no. 1. January, 1937. p. 34-38. Described here is accelerated test method developed for determining relative resistance of various commonly used metals for valve seat service to particular type of erosion known as "wire drawing". Number of photomicrographs of test specimens are reproduced. Author includes discussion of factors to be considered in selection of valve seating materials and presents some results of studies.

Progress report on contour furrowing in the Corn Belt. By Arnold S. Dahl. Soil Conservation. v. 2, no. 7. January, 1937. p. 141-142, 145.

Soil conservation is now farmer's own job. By W.A. Steel. Farm and Ranch. v. 55, no. 23. December 1, 1936. p. 19.

Soil defense in the Piedmont. E.M. Rowalt. Washington, D.C. 1937. 63p. U.S. Department of Agriculture. Farmers' bulletin no. 1767.

Spreading water in the East. By Grover Brown. Soil Conservation. v. 2, no. 7. January, 1937. p. 143, 145. 1. Uniform slopes. 2. Disposal of water from diversion ditch. 3. Drainage of spring areas. 4. Conducting water from shallow draws.

Studying the soil from the skies. Work. v. 2, no. 1. January, 1937. p. 28-29.

Use of bluegrass sod in the control of soil erosion. R.E. Uhland. Washington, D.C., 1936. 13p. U.S. Department of Agriculture. Farmers' bulletin no. 1760.

Wind erosion of soils in the agricultural areas. By R.L. Griffiths. Journal of the Department of Agriculture of South Australia. v. 40, no. 1. August, 1936. p. 25-40. Summary: (1) Wind erosion is serious problem in some of agricultural as well as pastoral areas of South Australia. (2) Practically all countries of world have problems connected with wind or water erosion. (3) Causes of wind erosion are: (a) Soil types with particles of even size which have little cohesion. Sandy soils are the worst types. (b) Removal of natural cover, allowing wind to sweep unrestricted over large areas. (c) Methods, including use of fire, which destroy soil humus and provide nothing to replace it. (d) Overcropping, including bare fallow periods, which reduces fertility and further depletes soil humus. (e) Overgrazing, leaving surface bare, and starting drifts from tramping of stock. (4) Control methods must have for their objective the keeping of some cover over land subjected for their objective the keeping of some cover over land subjected to erosion all the time, and a farming system which will restore and not further deplete humus content of soil. (5) While rotation methods, including minimum of growing of cereals for sale off farm, and maximum of pastures, including Lucerne and cereal crops fed to livestock on farm, are essential. (6) Building up of stock-carrying capacity on pasture land by liberal use of superphosphate to promote growth and better species, also use of

Erosion Control. (Cont'd)

superphosphate to promote growth and better species, also use of plants such as Wimmera rye grass will help considerably. (7) Controlled grazing including subdivision into small paddocks and provision of many watering places so that livestock may be handled judiciously, will prevent overstocking and consequent trampling of farm animals starting erosion. (8) Modified cultivation practices, leaving no bare land surface as in usual fallow, but instead leaving stubble or grass residues on top of cultivated land, or planting such land sparsely with oats or rye, and keeping in control by sheep, are necessary. (9) Wandering sand dunes must be controlled. (10) Planting of timber belts on sand dunes, also along subdivision fences, will break force of wind, and also provide necessary shelter for livestock.

Farm Buildings.

Economical equipment, better buildings and more irrigation, are farm trends. By S. H. McCrory. Better Farm Equipment and Methods. v. 9, no. 5. January, 1937. p. 9, 23.

Farm Income.

Farm income gains in all regions. American Fertilizer. v. 85, no. 13. December 26, 1936. p. 22. Largest gains of 15 and 12 per cent respectively, occurred in east north central and south central states, while fairly uniform increases ranging from 6 to 9 per cent took place in other four regions.

Farm income guaranteed. Assurance of larger revenue for 33 million people is major business factor. By Howard M. Greene. Magazine of Wall Street. v. 59, no. 2. November 7, 1936. p. 92-93, 125-126.

Lower production costs increase net farm incomes. By Harry G. Davis. Better Farm Equipment and Methods. v. 9, no. 5. January, 1937. p. 8. Low cost production affords excellent type of insurance for farmers against price declines. It increases profits when prices are above their costs, and it reduces their losses when prices are too low.

Farm Machinery and Equipment.

Combines come East. By William A. Haffert. New Jersey Farm and Garden. v. 7, no. 5. May, 1936. p. 11. They represent trend in farm machinery manufacture - trend toward production of machinery definitely geared to family-sized farm.

Farm production costs increasing. Farm Machinery & Equipment. no.1836. December 15, 1936. p. 8. Government Bureau predicts enlarged farm machinery demand in 1937.

Farm production costs increasing. Better Farm Equipment and Methods. v. 9, no. 5. January, 1937. p. 4. Predicts enlarged farm machinery demand in 1937.

Farm Machinery and Equipment. (Cont'd)

John Deere. Implement and Tractor. v. 52, no. 1. p. 52-57, 69. January 9, 1937. Story of a country blacksmith of the Illinois prairie frontier, whose genius one hundred years ago "gave to the world the steel plow."

John Deere Centennial. Farm Implement News. v. 58, no. 1. January 14, 1937. p. 58-63.

John Deere conquest of the prairie. By George F. Massey. Northwest Farm Equipment Journal. v. 51, no. 1. January, 1937. p. 30-48.

Grain drills through thirty-nine centuries. By Russell H. Anderson. Agricultural History. v. 10, no. 4. October, 1936. p. 157-205.

Growing and feeding grain sorghum. J.H. Martin, J.S. Cole and A.J. Semple. Washington, D.C., 1936. 46p. U.S. Department of Agriculture. Farmers' bulletin no. 1764.

M-M bursts forth with junior harvester. Farm Implement News. v. 57, no. 26. December 17, 1936. p. 24-25.

Machines fail. Who is at fault. By L.W. Hurlbut. Implement and Tractor. v. 52, no. 1. p. 110. January 9, 1937.

1936 farm equipment sales highest since 1930. Implement Record. v. 34, no. 1. p. 15. January, 1937. Latest Dun & Bradstreet report shows machinery output 35% above 1935. Big gain in tractors during year.

Sees need for design of new farm machines. Electrical World. News issue. v. 106, no. 52. December 26, 1936. p. 6. Present equipment not suited to take full advantage of electric power.

Spreader pays its way. Better Farm Equipment and Methods. v. 9, no.5. January, 1937. p. 5, 24. Cash returns and increased soil fertility make this labor-saving machine most essential.

Trailing John Deere and his steel plow. By George F. Massey. Implement Record. v. 34, no. 1. p. 30-42. Story of invention and industry. One hundred years of advancement.

Farm Power.

Tractor versus horses on the small farm. By L.S. Duckmanton. Journal of the Department of Agriculture of South Australia. v. 40, no. 2. September, 1936. p. 179-180. Costs. Care. Side lines.

Feed Grinders and Grinding.

Feed grinding. G. Bohstedt. Madison, Wis., 1936. 16p. Wisconsin. College of Agriculture. Extension Service. Circular no. 286.

Fences.

Blauser advises on electric fencing. Jersey Bulletin and Dairy World. v. 55, no. 49. December 2, 1936. p. 1555.

Cautions in the use of electric fences. By H.W. Riley. Agricultural Leaders' Digest. v. 17, no. 8. November, 1936. p. 13. Danger lies in use of homemade controlled unit. These devices usually are crude and consist merely of electric bulb in series of bulb and poorly constructed interrupter. They present distinct hazard

Twenty months with electric fencing. By Hugh G. Van Pelt. Jersey Bulletin and Dairy World. v. 55, no. 53. December 30, 1936. p. 1669.

Fertilizer Placement.

Fertilizer placement for potatoes. By B.E. Brown and G.A. Cumings. American Potato Journal. v. 13, no. 10. October, 1936. p. 269-272.

Fireplaces.

Fireplace. Domestic Engineering. v. 149, no. 1. January, 1937. p. 85, 92-93, 96-97. Discussion as to whether it adds to or subtracts from total heat.

Floods and Flood Control.

Determining flood discharges from small watersheds. By David L. Yarnell. Agricultural Engineering. v. 18, no. 1. January, 1937. p. 13-14.

Flood protection data. Progress report of the Committee: Discussion. By Charles D. Curran and Edward N. Whitney. Proceedings of the American Society of Civil Engineers. v. 63, no. 1. January, 1937. p. 218-221

Floods break all records in Lower Ohio Valley. Engineering News-Record. v. 118, no. 4. January 28, 1937. p. 142-143. Long period of unusual rainfall raises river crests to ten feet above previous records. Water supplies and power services crippled in all small towns and most large cities along the lower Ohio.

Great Miami Valley floods sharply cut by dams system. Engineering News-Record. v. 118, no. 4. January 28, 1937. p. 143.

Recent Eastern floods and the National aspects of flood control. Civil Engineering. v. 7, no. 1. January, 1937. p. 25-32. Federal responsibility for flood control. Problems in developing a National flood protection policy. Economic aspects of flood control. Flood conditions in New England. New York floods of 1935 and 1936. 1936 flood in the upper Ohio Basin. Ideal organization for the river and flood service of the Weather Bureau. Federal plans for flood control.

Floods and Flood Control. (Cont'd)

Recent Eastern floods and the National aspects of flood control. Civil Engineering. v. 7, no. 1. January, 1937. p. 25-32. Federal responsibility for flood control. Problems in developing a National flood protection policy. Economic aspects of flood control. Flood conditions in New England. New York floods of 1935 and 1936. 1936 flood in the upper Ohio Basin. Ideal organization for the river and flood service of the Weather Bureau. Federal plans for flood control.

Frost Protection.

Frost prevention. Journal of the Department of Agriculture of South Australia. v. 40, no. 2. September, 1936. p. 162, 163. Reccommendations.

Fuels.

Heat losses and efficiencies of fuels in residential heating. By R.A. Sherman, and R.C. Cross. Heating, Piping and Air Conditioning. v. 9, no. 1. January, 1937. p. 53-64. Investigation consisted of series of tests on heating plants of 15 homes located in Columbus, Ohio, during 1935-36 heating season. Fuels included bituminous and semi-bituminous coals, by-product coke, natural gas and oil burned in warm-air furnaces and hot-water and steam boilers.

High compression! ! ! Will octane advantages offset low fuel cost? By R.I. Shawl. Implement Record. v.34, no. 1. p. 20. January, 1937. Experimentation has led many to believe that high compression will be outstanding tractor fuel of future. Outstanding preliminary surveys made in the field.

Hay Drying.

Development of a low cost hay drier. By J.W. Weaver, Jr. Agricultural Engineering. v. 18, no. 1. January, 1937. p. 25-27, 46.

New grass driers. Implement and Machinery Review. v. 62, no. 740. December 1, 1936. p. 746-747.

Heat Transmission.

Heat transfer. By Frank Page. Brewers Technical Review. v. 11, no. 11. November, 1936. p. 361-362. Two plants involving ingenious solutions of heat transfer problems have been selected to illustrate typical developments in this field. One is in lower range of temperature of heat transfer and other in higher. Together they show the way in which material improvement may be made by exercise of ingenuity in a field that is rapidly developing.

Heating.

Advantages and disadvantages of types of heating systems. Air Conditioning and Refrigeration News. v. 19, no. 14. December 2, 1936. p.32. Steam. Hot water. Hot air.

Heating. (Cont'd)

Description of various types of steam heating systems. Air Conditioning and Refrigeration News. v. 19, no. 18. December 30, 1936. p. 14-15.

Oil burners for home heating. Arthur H. Senner. Washington, D.C., 1936. 27 p. U.S. Department of Agriculture. Circular no. 406.

Hotbeds.

Mazda lamps light and heat hotbeds with improved results. By L.C. Porter and J.P. Ditchman. Magazine of Light. v. 6, no. 1. January, 1937. p. 15-17.

Houses.

Better-homes campaign gives new impetus to Tennessee Home-in-improvement program. Extension Service Review. v. 7, no. 11. November, 1936. p. 165-166.

Framed concrete residences. By A.W. Pioda. Engineering News-Record. v. 117, no. 27. December 31, 1936. p. 924-926. Rigidity, low cost, speedy erection and adaptability mark structural framing for small buildings. Forms standardized. Light-weightaggregate for insulation.

Federal home building service plan. Federal Home Loan Bank Review. v. 3, no. 4. January, 1937. p. 121-124. Program operates essentially as cooperative service between local lending agencies and local architects and technicians for the benefit of home builder with only such control by Federal Home Loan Banks and Federal Home Loan Bank Board as is necessary to insure that service offered will be competent.

Interior arrangement and decoration of farm homes. By Ellen Pennell. Agricultural Engineering. v. 18, no. 1. January, 1937. p. 20, 24.

Log cabin is staging come-back. By Elbert E. Karns. Farm and Ranch. v. 55, no. 22. November 15, 1936. p. 21.

Study of the Southern farm home in relation to comfort. By J.W. Simons and Frank B. Lanham. Agricultural Engineering. v. 18, no. 1. January, 1937. p. 9-10, 14. Cooperative research program was initiated between Bureau of Agricultural Engineering, U.S. Department of Agriculture, and College of Agriculture of University of Georgia. Purpose of study being conducted at university is to develop more satisfactory types of low-cost construction for farm houses. Investigation contemplates work on following problems in near future: 1. Absorption of solar heat during typical hours of day. 2. Loss of absorbed heat by radiation during night period. 3. Effect of ventilation in carrying off absorbed heat upon comfort. Several preliminary tests have been made to determine absorption of solar heat from data obtained.

Houses. (Cont'd)

Tourist homes in Maine. Rena Campbell Bowles. Orono, Maine, 1936. 30p. Maine. College of Agriculture. Extension service. Bulletin no. 231.

Hydroelectric Power.

Government power projects aggregate $1,300,000,000. Electrical World. v. 107, no. 1. January 2, 1937. p. 98-100. Boulder and Grand Coulee the largest, ultimately to develop 4,500,000 Hp. Local projects allotted $90,000,000 by the P.W.A. $43,000,000 by the R.E.A.

Hydro plants produce over 30 per cent of power used. Power Plant Engineering. v. 41, no. 1. January, 1937. p. 56-59. Large federal and state hydroelectric projects now under construction, factors in a comprehensive scheme for more effective use of our water resources.

Hydrology.

Summary of hydrologic data Ralston Creek watershed, 1924-1935. F.T. Mavis and Edward Soucek. Iowa City, Iowa., 1936. 70p. University of Iowa. Sutdies in engineering. Bulletin no. 9.

Insulation.

Insulating the farm home. Michigan Farmer. v. 186, no. 9. October 24, 1936. p. 5, 21.

Irrigation.

Factors affecting irrigation in western Washington: Letter from Charles J. Bartholet. Civil Engineering. v. 6, no. 11. November, 1936. p. 763-764.

First organized irrigation in Colorado. By R.E. Van Liew. Civil Engineering. v. 7, no. 1. January, 1937. p. 92.

Imperial digs out. By Wilbur O. Emerson. Country Gentleman. v. 106, no. 12. December, 1936. p. 12-13, 84-85. Without spending one cent of its own money, the largest irrigation district in the United States is "digging out" from beneath thirty-four years' accumulation of river silt, building a brand-new canal and water system, paying bill in full and, at same time, reducing its present annually budgeted expense account to tune of $712,500 per year.

Purpose behind water users election. Arizona Producer. v. 15, no.21. January 15, 1937. p. 1, 19.

Saving water with concrete. California Cultivator. v. 84, no. 1. January 2, 1937. p. 11.

Subirrigation method of supplying nutrient solutions to plants growing under commercial and experimental conditions. By Robert B. Withrow and J.P. Biebel. Journal of Agricultural Research. v. 53, no.9.

Irrigation. (Cont'd)

November 1, 1936. p. 693-701. Subirrigation method of supplying nutrient solutions to plants growing in sand culture which lends itself to large-scale production is described. It consists in principle of pumping nutrients from submerged reservoir into the bottom of a shallow bed of fine gravel or cinders with a centrifugal pump. The pump is controlled by an electric time switch which stops the operation when bench is flooded. The solution then flows back into tank through pump by gravity. Modifications of method are discussed for use in experimental set-ups on small scale, in which solution flows into and out of plots by gravity through raising and lowering of bottles of solution. Advantages of system are: (1) frequent and complete flushing of roots with air and nutrient solution, (2) economy of nutrients since solution drains back into tank again, and (3) completely automatic operation over long periods of time.

Supplemental irrigation in the humid region. Agricultural Engineering. v. 18, no. 1. January, 1937. p. 28. Report from Committee on Supplemental Irrigation of American Society of Agricultural Engineers, giving more detailed estimates of supplemental irrigation in various states of humid region.

Where irrigation is possible. By Tom M. Marks. Farm and Ranch. v.55, no. 22. November 15, 1936. p. 19.

Lighting.

Four systems of lights for the layers. By Roy E. Jones. New England Homestead. v. 109, no. 22. October 24, 1936. p. 12.

Lubrication.

Small electric compressor. Refrigeration, Cold Storage and Air Conditioning. v. 7, no. 7. October 31, 1936. p. 13, 15. Lubrication developments and problems encountered.

Meters.

Characteristics of transverse pitot tubes. By J.E. Christiansen and O.C. French. Agricultural Engineering. v. 18, no. 1. January, 1937. p. 21-24. Summary and conclusions: 1. Negative pressures on downstream side of transverse tubes were genally greater than positive pressures on upstream side. 2. Velocity traverses with orifice upstream were identical for all tubes, regardless of size, and were similar to those obtained with an improvised conventional type Pitot tube. Mean velocities computed from these traverses agree with end-cap orifice measurement. 3. Orifice-downstream traverses were affected by position of stuffing boxes with respect to pipe wall. Mean velocities computed from these traverses approximate velocities calculated from net pipe areas after deducting for areas occupied by tubes. 4. Tests indicate that velocities determined from mean-head for orifice-upstream and orifice-downstream

Motors. (Cont'd)

positions should be corrected for half area occupied by tube. 5. Positions of mean velocity were found to average 0.78 of radius from center of pipe. Average differences between velocities at 0.707 R and mean velocities were +3 per cent for orifice-upstream traverses and +1 per cent for mean-head velocity curves. 6. Static-pressure connections made by drilling holes through pipe wall were not reliable before burrs were removed. Bushing screwed in tapped hole gave erroneous results. Static-pressure tube inserted in tapped hole proved satisfactory for static-pressure determinations. 7. When properly used, transverse pitot tubes are reliable devices for measuring flow of water in pipes. Tests indicate that measurements within one per cent of true discharge are possible.

Miscellaneous.

How to prepare and present subject matter. By J.P. Fairbank. Extension Service Review. v. 7, no. 11. November, 1936. p. 170-171.

Models.

Construction and testing of hydraulic models, Muskingum watershed project. By George E. Barnes and J.G. Jobes. Proceedings of the American Society of Civil Engineers. v. 62, no. 10. December, 1936. p. 1501-1518. Paper describes laboratory facilities used in tests, and more important features of model fabrication, operation and test procedure. Time and personnel required, and cost of doing work are given. Effort is made to present a picture of physical equipment and organization required, and also cost of securing results on a well defined, although not necessarily typical, program of model studies.

Model of a rapid sand filter plant. By Ranald V. Giles. Civil Engineering. v. 6, no. 11. November, 1936. p. 779. Working model of a rapid sand filter plant, built last year at Drexel Institute of Technology, has proved to be valuable aid in teaching fundamentals of filter plant design. Apparatus includes mixing chambers, coagulation basin, and filter unit with rated capacity of 2 gallons per minute. Cost of materials did not exceed $35. and parts were fabricated and assembled in shops of Institute.

Use of models at Fort Peck dam. By Gail A. Hathaway. Civil Engineering. v. 6, no. 11. November, 1936. p. 741-745.

Motors.

Development of small motors in agriculture. Monthly Bulletin of Agricultural Science and Practice. v. 27, no. 11. p. 421-424. November, 1936. Motors using alcohol. Suction gas motors.

Poultry Houses and Equipment.

Chick brooding. G.E. Annin. Madison, Wis., 1936. 16p. Wisconsin. College of Agriculture. Extension Service. Circular no. 285.

Power.

Public power: Its financing and its advantages. By James D. Ross. Investment Banking. v. 7, no. 2. December 31, 1936. p. 52-58. Power rates, public and private power systems, increased power production, Federal Government plants.

Rainfall and Runoff.

Prediction of runoff aided by grouping rainfall data. By C.H. Eiffert. Engineering News-Record. v. 117, no. 27. December 31, 1936. p. 917-919. Combining the records of areas possessing uniform rainfall characteristics to produce a single record for the total number of years covered makes possible long-range prediction of excessive precipitation.

Rammed Earth.

Building with adobe no cheaper than brick in town, but on remote farms it has advantages. By Harold C. Schwalen. Arizona Producer. v. 15, no. 21. January 15, 1937. p. 11. In adobe farmer or rancher has satisfactory building material for construction of farm buildings at reasonable cost. With understanding of characteristics of material, and knowledge of special precautions necessary in adobe construction, its use is warranted in better types of house construction. Cost of first-class adobe construction in urban districts is comparable with that of brick construction, but for the isolated rancher its use will result in real saving.

Refrigerants.

Control of refrigerants. By D.D. Wile. Power Plant Engineering. v. 41, no. 1. p. 70-71. January, 1937.

Rio Grande.

Stabilizing the Rio Grande. By L.M. Lawson. Scientific American. v. 155, no. 2. August, 1936. p. 66-68. Meandering international border is being straightened. Canals, levees involved. Two countries exchange territory. Prevent future damage.

Silt.

Modern conceptions of the mechanics of fluid turbulence: Discussion. By Hunter Rouse. Proceedings of the American Society of Civil Engineers. v. 63, no. 1. January, 1937. p. 116-136.

Soil Moisture.

Soil moisture conservation. By Raymond R. Drake. Agricultural Engineering. v. 18, no. 1. January, 1937. p. 15-16. Basin lister tillage on fallow land the past few years has been most successful in eliminating all runoff losses. Experimental results are not sufficient to date to make definite conclusions as to value of this type of tillage, but if results continue to be favorable, basin-lister tillage will find a definite place in fallow, wheat, and row-crop tillage for soil control and moisture conservation.

Soils.

Neutralization curves of the colloids of soils representative of the great soil groups. M.S. Anderson and Horace G. Byers. Washington, D.C. 1936. 39p. U.S. Department of Agriculture. Technical bulletin no. 542.

Spraying and Dusting.

Equipment for applying dust fungicides to seed grain. W.M. Hurst and others. Washington, D.C., 1936. 20p. U.S. Department of Agriculture. Circular no. 415.

Stationary spray equipment. By L.J. Doud. Purdue. Purdue Agriculturist. v. 31, no. 4. January, 1937. p. 47, 49.

Surveys.

Correlating ground and air surveys. By Arthur W. Lambert, Jr. Civil Engineering. v. 6, no. 11. November, 1936. p. 732-736. How maps are made from aerial photographs by use of stereoscope and ground controls. Describes in some detail art of photogrammetry, or making of maps from aerial photographs. Article conclused with evaluation of air and ground surveys, pointing out that best results are achieved when two are used in effective combination.

Tennessee River.

Tennessee Valley Experiment - V. River development on trial. Engineering News-Record. v. 117, no. 27. December 31, 1936. p. 929-933.

Terracing.

Terrace cross sections as influenced by soil, crops, land slopes, and farm machinery. By A.T. Holman. Agricultural Engineering. v. 18, no. 1. January, 1937. p. 5-8. Summary and conclusions: (1) Although difference in soil type, eventually, may influence the design, construction and operation of terraces, present information does not justify radical departure from conventional terrace design and specification. (2) Rate and quantity of runoff from terraced land vary materially for different crops. But equally large variations in runoff and erosion occur for same crop in different stages of its growth, and for different seasons and climatic conditions. Present data indicate that it is unsound practice to lower standard of terraces on assumption that cover crops, including legumes and small grains, and rotations and strip cropping will greatly reduct runoff and erosion from most damaging rains. (3) Degree of land slope continues to be dominant factor in determining spacing of terraces, and in limiting width of terraces. Present data and experience indicate that conservative spacing of terraces should be continued. (4) Terrace construction should be accomplished in manner that prevents development of furrow at base of terrace on lower side. Tillage and maintenance practice should be so accomplished that uniform slope of soil will develop from crown of terrace to bottom of channel of next lower terrace. (5) Net terrace height of 13 inches has conveyed

Terracing. (Cont'd)

flows of 6.1 sec. ft. but the cross section and channel were large. New terraces should have minimum height of 18 inches, if spacing, length and grade are normal. (6) Well constructed terraces have not interfered with operation of machinery. But, farm machinery could be operated more advantageously, if greater flexibility were provided. (7) Terraces should be used to prevent erosion on good farm lands before they erode to marginal or sub-marginal state. (8) Good terraces have been effective in preventing 80 to 85 per cent of erosion occurring for different crops. Conservative degisn of terrace cross sections requires ample channel area to prevent overtopping, and adequate size and stability of ridge to prevent breaking.

Terrace outlets for Missouri. Marion W. Clark. Columbia, Mo., 1936. 27p. Missouri. College of Agriculture. Agricultural extension service. Circular no. 355.

Tobacco.

Electric kiln used in curing tobacco. Rural Electrification News. v. 2, no. 5. January, 1937. p. 19-20. Experiments conducted by State Electricity Commission of Victoria, Australia. Gives diagrammatic sketch of electric kiln.

Traction.

Fundamental approach to tillage and traction research problems. By R.W. Trullinger. Agricultural Engineering. v. 18, no. 1. January, 1937. p. 17-19. Logical approach to permanent solution of tillage and traction problems consists of efforts to establish widely applicable basic principles governing relationship between soil science and force reactions in soils on one hand, and, on other hand, to establish similar basic principles governing relationship between force reactions in soils and principles of design of implements which will accomplish desired tillage and traction results in soils of known dynamic properties.

Tractors.

Farm requirements of a small all-purpose tractor. Market Growers Journal. v. 59, no. 12. December 15, 1936. p. 495. Small general-purpose tractor should meet all requirements for plowing, planting, cultivating and harvesting on corn belt farms of a size suited to its plowing capacity, replacing three to six horses.

"Marsh buggy" a tractor hybrid, travels land or water. Implement Tractor. v. 52, no. 1. p. 122. January 9, 1937. 7500-pound vehicle is $22\frac{1}{2}$ feet long, and is powered by a Ford V-8 engine equipped with an oversized cooling system. At rear of engine is regular passenger car transmission coupled in series with a McCormick-Deering tractor gear box. Tractor transmission is fastened rigidly

Tractors. (Cont'd)

to frame, and rear wheels are mounted on ends of extended axles. Combination of two transmissions permits ten forward and six reverse speeds. Front wheels receive power from chains passing over sprockets on back axles. This gives differential action between wheels on either side but not between front and rear. Tractor transmission is provided with two brakes, each to control wheels on one side. If one of tires becomes punctured constant pressure can be maintained by starting a compressor which feeds air into tube. Compressor's output is sufficient to keep balloons fully inflated until the "Marsh Buggy" can be returned to base of operations where leaky tube can be repaired or replaced. In water or in marshes traction is obtained by attaching twelve treads to each wheel. These were made from 2-inch rubber hose sealed at ends and provided with air valve through which they are inflated to pressure of 25 pounds per square inch. Inflation is necessary to keep the links from flattening out under the weight of the vehicle. It can be operated over smooth ground at speed of 35 miles per hour and is capable of naviga ting marshes at between 10 and 12 miles an hour. In water the speed is slightly in excess of six knots.

Marsh buggy crosses swamps. Engineering News-Record. v. 118, no. 4. January 28, 1937. p. 131.

Tung Oil.

Tung oil production in America. By C.C. Concannon. Cotton and Cotton Oil Press. v. 37, no. 47. November 21, 1936. p. 3-5. Its history and progress.

Ventilation.

It's the ventilation that does the trick. By William A. Haffert. New Jersey Farm and Garden. v. 7, no. 7. July, 1936. p. 16-17. Gives cross section of house, showing plan of ventilation system.

Water, Underground

Ground water flows and yields. By R.L. McNamee. Water Works and Sewerage. v. 84, no. 1. January, 1937. p. 16-17. A method of theoretical estimation confirmed by actual pumping records.

Water Cooling.

Hot well water cooled for use in city distribution system. Engineering News-Record. v. 118, no. 4. January 28, 1937. p. 130-131. Water at 110 degrees Fahrenheit from a flowing well at Riverside, California, is cooled to 85 degrees F. by evaporation process before going into city system.

Water Heating.

Application of electric water heaters to domestic service. By C.G. Hillier. Heating, Piping and Air Conditioning. v. 8, no. 11. November, 1936. p. 632-636.

Water Purification.

Safe drinking water. W.L. Mallmann. East Lansing, Michigan. 1936. 7p. Michigan state college. Extension division. Extension bulletin no. 173.

Water Rights.

Administrative control of underground water: Physical and legas aspects: Discussion. By H.J.F. Gourley and O.J. Baldwin. Proceedings of the American Society of Civil Engineers. v. 62, no. 10. December, 1936. p. 1598-1603.

Administrative control of underground water: Physical and legas aspects: Discussion. By G.E.P. Smith and David G. Thompson. Proceedings of the American Society of Civil Engineers. v. 63, no. 1. January, 1937. p. 141-163.

Water Supply.

Water resources of New England. Public Works. v. 67, no. 9. September, 1936. p. 9-12. Existing conditions and problems on three interstate rivers - the Connecticut, Merrimack and Blackstone.

Windbreaks.

Windbreak as a farm asset. Carlos G. Bates. Washington, D.C., 1936. 20p. U.S. Department of Agriculture. Farmers' bulletin no. 1405.

Windmills.

Observations on the use of high speed win-driven propeller for generating low voltage electricity. By W.H. Sheldon. Quarterly bulletin of Michigan Agricultural Experiment Station. v. 19, no.1. August, 1936. p. 6-12. Summary of observations. 1. Successful operation of any wind-driven battery charger depends largely upon good exposure to wind, and ability of propeller to absorn energy from 8- to 12-mile-per-hour winds. 2. Propellers with very high tip speed ration developed with less speed than those with 9:1 ratio, thereby defeating purpose of higher tip speed ratio. 3. Propeller with four blades will generate about 50 per cent more current than two-blade propeller using same wind stream. 4. Length of propeller for direct drive used with generator A is limited to five feet if 8- to 10-mile-per-hour winds are to be used. Rewinding generator to start charging at 200 R.P.M. would make possible use of 7-foot propeller for direct dirve use. 7-foot propeller should absorb twice as much energy from wind as 5-foot propeller. 5. Unfortunately amount of electrical energy that can be generated by generator of given size is proportional to speed at which generator must operate. If automotive generator which normally cuts in at 800 R.P.M. is rewound to cut in at 300 R.P.M. maximum charging rate in amperes will also be reduced by 75 per cent. 6. Although rewound generator

Windmills. (Cont'd)

eliminates need of gear, chain or belt drive it is more expensive than used automotive generator. 7. Individual who wishes to build wind-driven battery charger will be more sure of success if he uses standard automotive generator with V-belt drive from four-blade propeller at least six feet long.

When the wind dies down. By Ben Maxwell. Electricity on the Farm. v. 10, no. 1. January, 1937. p. 7-8.

World Power Conference.

Power and large dams. Engineering News-Record. v. 117, no. 12. Sept. 17, 1936. p. 413-415. Third World Power Conference and Second Congress on large dams held simultaneously in Washington. Power Conference devotes its entire time to economic questions. Technical problems discussed at the dam congress.

Power Conference sidelights. Engineering News-Record. v. 117, no. 12. Sept. 17, 1936. p. 422-423. Power resources, developments, and needs of countries throughout the world as revealed by interviews with delegates to the World Power Conference.